

AMENDMENTS TO THE CLAIMS

Claims 1-25 (canceled).

Claim 26 (currently amended): An RFID device comprising:

a first electrical component having

a first electrically conductive contact;

a second electrical component having

a second electrically conductive contact;

B1 wherein the first and second electrically conductive contacts are in alignment with one another

at least one electrically conductive hard particle attached without an adhesive to at least one of the first and second electrically conductive contacts,

wherein the at least one electrically conductive hard particle has a hardness at least as great as that of at least one of the first and second electrically conductive contacts;

a non-conductive adhesive disposed between the first and second electrically conductive contacts;

wherein the first and second electrically conductive contacts are held together by the non-conductive adhesive once the adhesive cures;

wherein a permanent electrical connection is formed between the first and second electrically conductive contacts; and

wherein a permanent physical attachment is formed between the first electrical component and the second electrical component.

B2 Claim 27 (original): The RFID device of claim 26, wherein the at least one electrically conductive hard particle pierces a surface of at least one of the first and second electrically conductive contacts.

Claim 28 (original): The RFID device of claim 26, wherein the nonconductive adhesive is further disposed between the first electrical component to the second electrical component.

Claim 29 (original): The RFID device of claim 26 further comprising an electrically conductive metal layer deposited on the at least one electrically conductive hard particle.

Claims 30-33 (withdrawn).

Claim 34 (original): The RFID device of claim 26, wherein the first component is a chip and the second component is an electrically conductive area, and wherein the at least one electrically conductive hard particle is attached to a bond pad on the chip.

Claim 35 (original): The RFID device of claim 26, wherein the first component is a chip and the second component is an electrically conductive area, and wherein the at least one electrically conductive hard particle is attached to a contact area on the electrically conductive area.

Claim 36 (original): The RFID device of claim 32, 33, 34 or 35, wherein the electrically conductive area comprises a conductive path.

B3 Claim 37 (original): The RFID device of claim 32, 33, 34 or 35, wherein the electrically conductive area comprises an antenna.

Claim 38 (original): The RFID device of claim 32, 33, 34 or 35, wherein the electrically conductive area comprises a conductive material comprising at least one of the following: copper, aluminum, gold, metal foils, conductive inks, conductive pastes, and graphite.

Claim 39 (original): The RFID device of claim 26, wherein the at least one electrically conductive hard particle is a metal particle comprising at least one of the following: copper, aluminum, nickel, tin, bismuth, silver, gold, platinum, palladium, lithium, beryllium, boron, sodium, magnesium, potassium, calcium, gallium, germanium, rubidium, strontium, indium, antimony, cesium, and barium, and alloys and intermetallics of these metals.

Claim 40 (original): The RFID device of claim 26, wherein the at least one electrically conductive hard particle comprises a non-electrically-conductive particle core surrounded by a metal layer, and wherein the non-electrically-conductive particle core comprises at least one of the following: diamond, garnet, ceramic, oxides, silicides, silicates, carbides, carbonates, borides, boron fibers, and nitrides.

B4 Claim 41 (currently amended): The RFID device of claim 26 or 40, wherein the at least one electrically conductive hard particle is attached to at least one of the first and second electrically conductive contacts by a metal plated layer deposited by an electrolytic metal-particle co-deposition process.

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Claim 42 (currently amended): The RFID device of claim 26 or 40, wherein the at least one electrically conductive hard particle is attached to at least one of the first and second electrically conductive contacts by a metal plated layer deposited by an electroless metal-particle co-deposition process.

Claim 43 (original): The RFID device of claim 40, wherein the metal layer comprises a nickel layer and wherein the non-electrically conductive particle core comprises diamond.

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Claim 44 (original): The RFID device of claim 40, wherein the metal layer comprises at least one of the following: copper, aluminum, nickel, tin, bismuth, silver, gold, platinum, palladium, lithium, beryllium, boron, sodium, magnesium, potassium, calcium, gallium, germanium, rubidium, strontium, indium, antimony, cesium, and barium, and alloys and intermetallics of these metals.

Claim 45 (original): The RFID device of claim 26, wherein the at least one electrically conductive hard particle comprises a plurality of electrically conductive hard particles.

Claim 46 (original): The RFID device of claim 26, wherein the RFID device comprises a smart card.

Claim 47 (original): The RFID device of claim 26, wherein the RFID device comprises a smart inlay.

Claim 48 (original): The RFID device of claim 47, wherein the smart inlay comprises a component of at least one of a smart label and a smart paper.

~~Claims 49-65 (canceled).~~

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Claim 66 (currently amended): An electrical component for use in an RFID device, the electrical component for physically and electrically connecting to an additional electrical component in the RFID device, the additional electrical component having a second electrically conductive contact that forms an electrical connection with the first electrically conductive contact, the electrical component comprising:

a component base, the component base further comprising

a first electrically conductive contact for forming an electrical connection with a second electrically conductive contact on the additional electrical component; and

at least one electrically conductive hard particle attached without an adhesive to the first electrically conductive contact,

wherein the at least one electrically conductive hard particle has a hardness at least as great as that of the second electrically conductive contact.

Claim 67 (original): The electrical component of claim 66, wherein the electrical component is one of a plurality of particle-enhanced electrical components separated from an array comprising the plurality of particle-enhanced electrical components.

Claim 68 (original): The electrical component of claim 67, wherein each of the plurality of particle-enhanced electrical components is identical.

Claim 69 (original): The electrical component of claim 67, wherein the array comprises at least one of a semiconductor wafer, a flexible circuit tape, a sheet comprising a plurality of chip carriers, a sheet comprising a plurality of chip modules, and a sheet comprising a plurality of antenna on a substrate.

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Claim 70 (original): The electrical component of claim 66, wherein the electrical component comprises at least one of the following: a chip, a chip carrier, a chip module, and a conductive area.

Claim 71 (original): The electrical component of claim 70, the chip further comprises at least one of the following: a discrete circuit device, an integrated circuit device, a memory device, a microprocessor device, a transceiver device, and an electro-optic device.

Claim 72 (original): The electrical component of claim 70, wherein the electrically conductive area comprises a conductive path.

Claim 73 (original): The electrical component of claim 70 or 72, wherein the electrically conductive area comprises an antenna.

Claim 74 (original): The electrical component of claim 70, wherein the electrically conductive area comprises a conductive material comprising at least one of the following: copper, aluminum, gold, metal foils, conductive inks, conductive pastes, and graphite.

Claim 75 (original): The electrical component of claim 66, wherein the at least one electrically conductive hard particle is a metal particle comprising at least one of the following: copper, aluminum, nickel, tin, bismuth, silver, gold, platinum, palladium, lithium, beryllium, boron, sodium, magnesium, potassium, calcium, gallium, germanium, rubidium, strontium, indium, antimony, cesium, and barium, and alloys and intermetallics of these metals.

Claim 76 (original): The electrical component of claim 66, wherein the at least one electrically conductive hard particle comprises a non-electrically-conductive particle core surrounded by a metal layer.

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Claim 77 (original): The electrical component of claim 76 wherein the non-electrically-conductive particle core comprises at least one of the following: diamond, garnet, ceramic, oxides, silicides, silicates, carbides, carbonates, borides, boron fibers, and nitrides.

Claim 78 (currently amended): The electrical component of claim 66 or 76, wherein the at least one electrically conductive hard particle is attached to the first electrically conductive contact by a metal plated layer deposited by an electrolytic metal-particle co-deposition process.

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Claim 79 (currently amended): The electrical component of claim 66 or 76, wherein the at least one electrically conductive hard particle is attached to the first electrically conductive contact by a metal plated layer deposited by an electroless metal-particle co-deposition process.

Claim 80 (original): The electrical component of claim 76, wherein the metal layer comprises a nickel layer and wherein the non-electrically conductive particle core comprises diamond.

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Claim 81 (original): The electrical component of claim 76, wherein the metal layer comprises at least one of the following: copper, aluminum, nickel, tin, bismuth, silver, gold, platinum, palladium, lithium, beryllium, boron, sodium, magnesium, potassium, calcium, gallium, germanium, rubidium, strontium, indium, antimony, cesium, and barium, and alloys and intermetallics of these metals.

Claim 82 (original): The electrical component of claim 66, wherein the at least one electrically conductive hard particle comprises a plurality of electrically conductive hard particles.

Claim 83 (withdrawn).

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Claim 84 (original): The electrical component of claim 66, wherein the RFID device comprises a smart inlay.

Claim 85 (original): The electrical component of claim 84, wherein the smart inlay comprises a component of at least one of a smart label and a smart paper.

Claims 86-93 (canceled).

Claim 94 (new): An RFID device comprising:
a first electrical component having
 a first electrically conductive contact;
a second electrical component having
 a second electrically conductive contact;
 wherein the first and second electrically conductive contacts are in alignment
with one another
 at least one electrically conductive hard particle attached to at least one of the first and
second electrically conductive contacts,
 wherein the at least one electrically conductive hard particle has a hardness at
least as great as that of at least one of the first and second electrically conductive contacts,
and
 wherein the at least one electrically conductive hard particle pierces a surface
of at least one of the first and second electrically conductive contacts;
a non-conductive adhesive disposed between the first and second electrically
conductive contacts;
 wherein the first and second electrically conductive contacts are held together by the
non-conductive adhesive once the adhesive cures;
 wherein a permanent electrical connection is formed between the first and second
electrically conductive contacts; and
 wherein a permanent physical attachment is formed between the first electrical
component and the second electrical component.

Claim 95 (new): An electrical component for use in an RFID device, the electrical
component for physically and electrically connecting to an additional electrical component in
the RFID device, the additional electrical component having a second electrically conductive
contact that forms an electrical connection with the first electrically conductive contact, the
electrical component comprising:

 a component base, the component base further comprising
 a first electrically conductive contact for forming an electrical connection with
a second electrically conductive contact on the additional electrical component; and
 at least one electrically conductive hard particle attached to the first electrically
conductive contact,
 wherein the at least one electrically conductive hard particle has a hardness at

least as great as that of the second electrically conductive contact, and
wherein the at least one electrically conductive hard particle pierces a surface
of at least one of the second electrically conductive contact.
